Andreas H. W. Küpper

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Profile

German astrophysicist with more than 10 years of experience in

- data mining/munging/analysis, machine learning, and statistical modeling,
- programming, scripting, and high-performance computing,
- leadership, advising, and communication.

Relevant Professional Experience

Columbia University, New York, NY, *Hubble Research Fellow* — Since 2013

- Measured the mass of the Milky Way by fitting 10^6 tidal stream models to data.
- Studied dark matter substructure by producing and analyzing a data set of 10^9 stars.

Yale University, New Haven, CT, *Research Fellow* — 2013

- Developed a Bayesian framework in Python/C for statistical modeling of tidal streams.

Universität Bonn, Germany, *Postdoctoral Researcher* — 2011 – 2013

- Invented a now widely used algorithm for efficient statistical modeling of tidal streams.

Universität Bonn, Germany, *Graduate Student Researcher* — 2007 – 2011

- Studied the formation of tidal streams with high-performance N-body simulations.
- Published a popular C/Fortran code for generating star cluster models.

Education

Universität Bonn, Germany, Ph.D. in Astronomy, *summa cum laude* — 2007 – 2011

Penn State University, PA, Bootcamp on Astrostatistics with R — June 2010

Universität Bonn, Germany, Diplom in Physics (M.Sc. equivalent) — 2001 – 2007

Expertise

Data analysis, machine learning, and statistical modeling

- Bayesian inference modeling, Markov Chain Monte Carlo, maximum likelihood estimation,
- logistic/linear/non-linear regression, kernel density estimtation, k-nearest neighbor algorithms,
- minimum spanning tree algorithms, linear/non-linear least-square fitting, KS testing,
- principal component analysis, Gaussian mixture models

Programming, scripting, and high-performance computing

- Python (NumPy, SciPy, matplotlib, Scikit-learn, Pandas), C, R, Linux scripting,
- Excel, Octave, JavaScript, Fortran, OpenMP, MPI, CUDA

Leadership, advising, and communication

- organization/coordination of $10+$ larger meetings and workshops, student/postdoc representative,
- advisor to 8 PhD/MSc students, $50+$ presentations at conferences/public events, $20+$ publications